A longitudinal study of learning for a group of Indigenous Australian university students: dissonant conceptions and strategies[1, 2, 3]

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Abstract. Conceptions of learning and strategies used by 15 Indigenous students in three Australian universities were studied longitudinally over three years. Their academic achievements were good, but at a high cost in terms of time and effort. In spite of the fact that almost half of the students expressed higher-order (qualitative) conceptions of learning in the first year and more in the second and third years, all of the students reported using highly repetitive strategies to learn. That is, they did not vary their way of learning, reading or writing in the beginning of their studies and less than half of them did so at the end of the three years. It is argued that encountering variation in ways of learning is a prerequisite for the development of powerful ways of learning and studying.

Key Words

Conceptions of learning, dissonance, higher education, phenomenography, longitudinal, strategies used to learn

Introduction

Some results from this three-year study have been described in other papers (Boulton-Lewis, Marton, Lewis & Wilss, 2000a, 2000b; Boulton-Lewis, Wilss & Lewis, 2001). In Boulton-Lewis, Wilss & Lewis we identified what we believed to be 'core' conceptions for the sample for each year and then for each student in each of the three years. These core conceptions were characterized more in terms of the approaches students took to learning than in terms of their statements about what learning was. This paper presents an analysis of the data from an alternative perspective which is intended to elicit what we believe to be dissonance between conceptions and strategies for some students. We found that what the students said about their views of learning could be categorised in a slightly modified version of Marton et al.'s (1993)

six conceptions based on their statements about learning and other information in the interviews. The strategies used by the students were categorised according to whether they used repetitive (focusing/rehearsal) or active strategies (organisation/elaboration) (cf. Wilss et al., 2000).

Learning from an Indigenous Australian perspective

In Australia the accepted definition of an Aboriginal or Torres Strait Islander person is "A person of Aboriginal or Islander descent who identifies as an Aboriginal or Islander and is accepted as such by the community with which he is associated" (Australian Bureau of Statistics and Australian Institute of Health and Welfare, 1997, p. 61). Studies of Aboriginal and Torres Strait Islanders within educational contexts have largely encompassed Aboriginal children. Findings include assertions that they have skills in spatial and visual recall that are superior to white children (Kearins, 1981), they usually process information simultaneously rather than successively (Klich & Davidson, 1984), they have the same capacity to process information as other Australian children (Boulton-Lewis, Neill & Halford, 1987), and in traditional cultural settings they learn by observation and imitation rather than by direct instruction (Collins, 1993).

Research into Indigenous university students' learning is somewhat limited and it is only recently that conceptions of learning held by these students have been investigated. Boulton-Lewis et al. (2000a, 2000b) and Boulton-Lewis, Wilss and Lewis (2001) found that first year Aboriginal and Torres Strait Islander university students held conceptions of learning that are similar to those of other university students. For the most part they focused on learning as understanding which was explained at a quantitative level as making sense of and remembering information and for some, using information. Understanding was also explained in a qualitative way as depending on relating and analysing information. Some also stated that learning meant acquiring information and that it led to personal growth. Other findings were that they approached learning in much the same way as other students and the way that some went about learning was not congruent with their conception of learning.

Differences that can be attributed to culture and that may impact on learning are reported in Boulton-Lewis et al. (2000a, 2000b). Aboriginal and Torres Strait Islanders are the most educationally disadvantaged group in Australia (Department if Education, Employment and Training, 1999) and they comprise only 1% of higher education enrolments compared to the National average participation rate of 4.8%. With regard to performance in higher education, indicators show that Aboriginal and Torres Strait Islander students have lower success rates than non-Indigenous students, that is 79% the success rate of non-Indigenous students, and they are less likely to persist with their university education (Department of Education,

Training and Youth Affairs, 1999). The underlying structure of the general education system in universities for such students is questioned by Bourke, Burden and Moore (1996) who maintain that overlooking their culture forces them to adopt the dominant culture of the education system in an assimilationist manner which may lead to them leaving courses.

Conceptions of learning

Conceptions of learning have resulted mostly from studies employing phenomenographic methodology. The focus of phenomenographic inquiry is to investigate the qualitatively different ways that people experience phenomena (Marton, 1988) and to delineate categories of description that depict conceptions. Svensson (1997) explains a conception as being dependent on both human activity and the world that is experienced by the individual, and as encompassing the "meanings and understandings of phenomena" (p. 163). Morgan and Beaty (1997) describe a conception of learning as a focus of awareness that constitutes part of a student's experience of learning. They explain that an experience has structural and referential aspects. The structural aspect concerns the constituent parts of the experience and their relationship to each other as well as contextual factors. Intertwined with structural aspects is the referential, or meaning, aspect.

Recent studies of conceptions of learning held by students in higher education include those in Western (Marton et. al, 1993) as well as non-Western cultures (Marton, Watkins & Tang, 1997; Watkins & Akande, 1994). Results indicate that there are common elements to conceptions of learning across cultures and these are closely aligned to Marton, et al.'s (1993) six conceptions of learning. The six conceptions, which build on Säljö's (1979) conceptions of learning, resulted from a longitudinal investigation involving British Open University students and are as follows: A. increasing one's knowledge, B. memorising, C. applying, D. understanding, E. seeing something in a different way, and F. changing as a person. According to Marton et al. (1993) these conceptions form a hierarchy with the first three focusing on *quantitative* dimensions of learning while the latter three are characteristically *qualitative*. The conception 'understanding' is the demarcation point as it relates to gaining *meaning* (Marton et al., 1993, p. 288). The first three conceptions concern taking in information as though it was "something ready-made" (Marton et al., 1993, p. 288) and devoid of meaning. Quantitative conceptions are usually correlated with the adoption of a surface approach to learning, whilst qualitative conceptions are usually related to deep approaches.

Some studies (Boulton-Lewis, Wilss, & Lewis; 2001; Watkins & Akande, 1994) have found that whilst students cite understanding as a conception of learning their awareness of this phenomenon varies from that reported by Marton et al. (1993). For example Watkins and Akande found Nigerian secondary school students explained 'understanding' in a superficial way. That is, the students did not seem to take an active role in learning and they expected teachers to impart

'understanding'. With distance learners at the University of the South Pacific Mugler and Landbeck (2000) found what could be interpreted as 'levels of understanding'. Most students explained 'understanding' as 'knowing' the content or knowing how to do something while some stated that understanding was knowing the 'meaning' of subject matter. A depth dimension was evident when two students stated that understanding meant going 'deeper' into something. Entwistle and Entwistle (1997) examined the nature of understanding as explained by final year psychology students. They found that different forms of understanding that varied in depth. In the 'core' conceptions described by Boulton-Lewis et al. (2001) three kinds of understanding were described. The first two were at a quantitative level and the lowest related to memorising. Students either tried to remember in order to understand or vice versa. The focus was on making sense of the material through repetitive and hence quantitative means. The next kind of understanding was similar to the previous one except for an extra dimension of applying information in a practical way. The third kind of understanding was similar to Marton et al.'s conception, 'D. Understanding', where the intention was to understand by relating new information to relevant knowledge and experience and interpreting and breaking it down.

It is asserted that cultural beliefs and practices play an important part in learning (Gordon, Cantwell & Moore, 1998; Hatano & Miyake, 1991) and it is often the case that different cultures emphasise different teaching and learning styles (Mugler & Landbeck, 1997). Consequently some studies outside Western communities have found conceptions of learning that are similar to Marton et al.'s (1993) while others have not. Boulton-Lewis et al. (2000b) discuss these issues for Chinese and Nigerian students.

Developmental conceptions of learning

In higher education it has been the expectation that as students progress through their studies they will develop personal understanding and it is posited that their conception of learning may evolve concurrently. Entwistle (1997) believes this means that as students progress in a course their conception will move from one of acquiring "discrete packages of information" (p.11) to one that constitutes a change in themselves and the world around them. Van Rossum and Schenk (1984) found that many first year university students hold a reproductive conception of learning. They suggest this may be attributed to an emphasis on memorising in their secondary education. When Morgan and Beaty (1997) investigated conceptions of learning held by British Open University students over a six-year period they found the same five conceptions as Säljö (1979) and observed a progression from acquiring knowledge, to developing understanding, and seeing something in a different way. Additionally, like Marton et al. (1993), they found that some students regarded learning as contributing to a change in themselves. This finding serves to reinforce Entwistle's contention that conceptions develop over time in university. Cliff (1998) also investigated the

stability of conceptions over time with a group of mature-age postgraduate education students at the University of Cape Town. Many of the students came from school backgrounds that failed to prepare them for the demands of higher education. Results showed that most held an 'accumulate knowledge' conception of learning that remained stable over a year of study.

Dissonance

When students possess a coherent approach and conception of learning it should follow that their learning experience will result in productive engagement with both content and context. However Vermunt (1996) contends that instruction plays a crucial role in the experience of learning and warns that "instruction does not lead to learning automatically" (p.25). Sometimes students experience instruction that fails to match their way of learning, they may approach learning in ways that are counter-productive or incongruent with their conception of learning (Wilss et al., 2000), or they may lack motivation. Some studies have examined contextualised learning behaviours of students in higher education to determine reasons for such manifestations (Meyer, 1991, 2000; Prosser, Trigwell, Hazel, & Waterhouse, 2000). Meyer explains the breakdown or lack of coherent linkages between some or all of the common sources of explanatory variation in contextualised learning behaviour as 'dissonance'. This is characterised by variation in contrasting forms of generic cognitive processes, motives, regulatory mechanisms, contextual perceptions and conceptions of learning. It is proposed that students who cannot reconcile dissonance are academically at risk.

Entwistle and Ramsden (1983) and Prosser et al. (2000) found evidence of dissonance that is based on students' lack of prior knowledge for studies they are currently undertaking. Prosser et al. conducted a phenomenographic analysis of physics students' understanding over a semester and found a disintegrated cluster who possessed poor conceptual knowledge, perceived the context as affording both surface and deep approaches and used both approaches. These were the lowest achieving students. They also found that students with well-developed prior knowledge were likely to adopt a deep approach and had well-developed knowledge at the end of their studies. Several studies that used the Inventory of Learning Styles (ILS) were examined by Vermunt and Verloop (2000) for evidence of dissonance. Five aspects of dissonance were found that included: lack of *differentiation*; lack of *integration*; and *incompatibility* in learning strategies, mental models and learning orientations; and *missing learning style elements* where some students learn according to the bare elements of a style, for example pure memorisation with no analytic elements. They may omit essential elements and this may result in low achievement.

Strategies

Strategies used by the students in our sample have been described elsewhere (Boulton-Lewis et al., 2000b). They were summarised and categorised at three levels:

- *focussing/rehearsal strategies,* which constitute a superficial interaction with information such as looking at pictures and skimming written material; they also include repetitive strategies such as reading over and over or writing and rewriting notes;
- *organisation/memory strategies,* which are characterised by processes aimed at arranging or structuring information and in some cases subsequently memorising the information. For example some students drew illustrations or developed schemas; and
- *elaboration/monitoring strategies,* which denote a deeper interaction with information in an effort to understand what is being learned. Students become actively involved with information by processes such as relating it to life experiences or discussing, analysing and synthesising what they are learning.

In this study we have focussed on two aspects of these strategies; the repeating over and over of material, which is a focussing/rehearsal strategy; and active learning which is a combination of the two other levels. At each level of strategies we were also able to identify and describe preferences for practical means of learning (Boulton-Lewis et al., submitted).

Rationale for the study

Phenomenographic methodology was used in this study to investigate Indigenous university students' conceptions of learning; the strategies students employed to learn were also examined. It was believed that such information would be of use in improving educational environments for these students. The research was conducted over three years (1997-1999) and provided opportunity to examine developmental aspects of the students' conceptions. An assumption was that if these students held conceptions of formal learning that are different from those held by mainstream students, such as those found by Marton et al. (1993, then this may cause problems for them in university learning. It is also important to know more about learning for this student population because, whilst there are increasing numbers of Indigenous students undertaking higher education courses, their attrition rate is higher than that of any other group (Bourke, Burden & Moore, 1996).

Methodology

Sample

The sample originally comprised 22 Aboriginal and Torres Strait Islander students from three universities in Brisbane and 15 of these students were available to be interviewed in the third year. Of these, 11 were studying a specialised bachelor degree program in Indigenous Primary Health Care. The others were studying bachelor degree courses in Built Environment and

Engineering, Business, Justice Studies and Arts/Law; 10 were male and 5 were female. Ages ranged from 18 to 48 years, with a mean age of approximately 25 years. Two students came from the Torres Straits, 9 were from regional country towns and 4 were from capital cities. Twelve had completed Year 12; the others had completed Year 10 but subsequently undertook studies at a Technical and Further Education College. Seven had prior incomplete experience at university and 3 at TAFE colleges.

The students came from diverse backgrounds and cultural experiences and most of them had difficult living and study conditions. For example some students experienced several moves in their place of residence during their school years and school experiences sometimes involved incidents of racism, periods of loneliness, and feelings of inadequacy. The students' awareness of their traditional–cultural heritage varied with some students holding strong ties to their heritage. These students spoke of cultural dances, feasts and possessing knowledge of tribal customs.

Interviews

Individual, semi-structured, audiotaped interviews, each lasting about an hour, were conducted by two trained Aboriginal research assistants[4] in conjunction with the first and fourth researchers. Predetermined questions, used to stimulate dialogue, covered the following: reasons for studying at university; methods of studying; the meaning of learning, understanding, and knowledge; learning outside university; and memorisation and learning. Following phenomenographic methodology (Svensson, 1997) the interviews were framed so that the questions related to each other and were contextualised. For example students were asked to *give an example of something they had learned recently*, followed by *what does learning mean to you*, *tell me about something you have learned outside of university* and *are learning at university and in other places the same or different*? The interviewer probed points, relevant to learning, as they arose.

Analysis

Interviews were transcribed from the audiotapes and analysed jointly by the researchers using a phenomenographic approach. The interviews were read and reread by each of the researchers and initial conceptions of learning were derived. In a modification of phenomenographic methodology, interview transcripts were then summarised in two ways: as a series of brief case studies and also as a summary over the three years of statements about learning, understanding, memorisation, the relation of the preceding three, the use of repetitive and other strategies and their high school/university learning experiences. These procedures were adopted to ensure rigour and to decrease the memory load for the researchers because there was a great deal of interview material to consider. The summaries served as concise indicators of important points and proved

to be a useful way of considering and managing the data. The researchers adopted an iterative approach, moving between the summaries and full transcripts, to ascertain conceptions and strategies. In this analysis an initial set of categories of description, aligned with the six conceptions identified by Marton et al. (1993), were derived. This was discussed and debated and resulted in an interim set of categories. Following this the researchers went back to the interviews and discussed the categories further until a final set of conceptions of formal learning and strategies were determined. The conceptions are hierarchical (Marton, 1994) and in each year students were assigned to the highest conception they explained.

Results

Conceptions of learning

Conceptions for the first year are reported in Boulton-Lewis et al. (2000a, 2000b) and for the first two years of the study in Boulton-Lewis, Wilss and Lewis (2001). In Boulton-Lewis et al. (2000a), with first year students only three main categories of conceptions of formal learning could be identified in the data; acquiring knowledge, understanding, and personal growth. In the study reported here the students were in third year and the data allowed us to undertake a different analysis. The lower categories were similar to the earlier ones although described a little differently. There were still varying interpretations of understanding. The category personal growth was not found by third year, subsumed probably into other categories but not raised directly, now the novelty of being a university student was gone. We thought we could recategorise one student as thinking of learning as seeing something differently in first year and we found two other students who held this category of conception by third year. We found one student who in second and third year could be categorised as seeing learning as changing as a person. Therefore it was possible to categorise students in this sample according to the conceptions of learning described by Marton et al. (1993). There were minor variations from Marton et al.'s original conceptions in categories B and C where some students talked about understanding in relation to memory of, and applying, knowledge. Descriptions of the conceptions (cf. Marton et al., 1993) exemplified by quotes from our data appear below. It is important to note that students may express more than one conception during the same interview. Consequently the examples that appear below may not be illustrative of the highest conception that was assigned to the student cited. The student number and year of the interview appears in brackets after the quote. The conceptions and strategies for this study are summarised, by student, in Table 1.

A. Increasing one's knowledge

This category is distinguished by 'its vagueness, its taken- for- granted nature' about learning. It is a general, inclusive, undifferentiated conceptualisation of learning which may include aspects of all the other conceptions. Learning increases knowledge as the label implies and this is often described in quantitative terms. The referential aspect of this conception, or the meaning of learning, is increasing knowledge. The structural aspect, which delimits this concept from the next two, is that there is little mention of how the knowledge will be used.

I: What does learning mean to you?

S: Just getting more knowledge of things you don't know and what's interesting or in the outside world. Just if I learn something new or not. (4:97).

I: So what's actually learning mean to you?

S: Learning. Being taught like becoming familiar with certain things that will effect you. . . Being able to know and answer when it comes up in something else that you knew from previous, so it helps you get along in the next thing. I don't know how to explain it but just filling your head with knowledge of your specific area. (1: 97).

B. Learning as memorising and reproducing

The referential aspect of this conception is to memorise and be able to reproduce something. This is usually confined to academic situations where the reproduction is for some kind of assessment. Learning in this conception is also described in quantitative terms and often as rote learning for reproduction, or repeated acts of learning. With our sample, as stated earlier, some students that we have categorised at this level did talk about understanding but by this they generally meant making sense of words or ideas so that they could then memorise and reproduce the material. The structural aspect relates to how the learning occurs.

I: What does learning mean to you?

S: Wanting to know knowledge and having to know that you have that knowledge there. Knowing that you've got that information there. Knowing that you've got something there that you can pass on to other people. . . They'll want to know something and they'll come to you and if you've got that information you can give it to them. . . . For an exam I have to memorise stuff. That's the only way I can answer the question in uni. (4:98)

C. Learning as applying

Learning here is conceptualised as 'the ability to apply some knowledge or procedure' (referential aspect). This is related to conception 'A' but the knowledge is applied when the

need arises. Students also talk about acquisition. Little mention is made of how learning takes place but in the case of the students in our sample there was also reference to understanding as in the previous concept. This mostly meant making some sense of the material concerned. This conception can be distinguished from 'A' by the emphasis on application and from 'B' by the fact that application is not necessarily immediate for assessment.

I: So how do you know when you have understood something?

S: Yeah I think that's practicality, when you can really make something workable. You do it. You can apply it and you can see what you've said or what you've done whether it's a sum or a conversation and you can see the effect it's had. (15:99)

D. Learning as understanding

The demarcation between this and the first three conceptions is 'meaning' as a way of seeing things, looking into something, discovering, relating, and getting different viewpoints. This focus on meaning is still delimited to the study/academic situation.

I: How would you define understanding?

S: Understanding for me is the ability to deconstruct somebody else's opinion or idea, reconstruct it in a way that not only I can understand but when I represent it back to that person it hasn't lost any of the meaning but we have broken away all the peripheral stuff, that's their opinion, to the core piece of information they have given me. (5:99).

E. Learning as seeing something in a different way

The referential aspect of this conception is similar to the previous one. However in the previous conception the learner was understanding a meaning or developing an idea whilst in this conception the learner is 'changing his or her way of thinking about something'. Emphasis is placed on the way in which things are seen from a different perspective, related to other things, or being parts of a greater whole. Seeing something in a different way is not restricted to the study situation but may be applied to the world as a whole. The delimiting aspect of this conception is the notion of change in the way of seeing something.

I: What about something that you learnt just recently?

S: Parts of the body and how it works was one of our subjects, it's about anatomy and stuff like that. It's amazing how the actual mechanics of the body works, different things connected to this and to that, how your body works. I see a body differently now, after seeing a post-mortem, I have a different way of seeing people, yes. I surprised myself, being an old-fashioned girl, spiritual and stuff like that. (9:97).

F. Learning as changing as a person

This conception usually only occurs in a few cases. It occurred for one student in our study in the second and third year. It builds on E and D and adds 'an existential aspect to learning'. The meaning of this conception depends on seeing phenomena differently as a result of learning, hence seeing the world differently, and thus changing as a person. It is delimited from the other conceptions by the personal change attributed to learning and knowledge.

I: Has the meaning of learning changed for you?

S: Learning now is painful.

I: Is painful?

S: Academic pursuit is painful. I don't care what anyone says a marriage of the academic pursuit is painful. Learning is hard simply because a lot of stuff you hear will conflict with what you believe personally and what you hold dear. Like I said my academic base was insignificant compared to what it is now. What I perceived to have known before now is minuscule to what I know now but in that what I have learn now has changed me personally as well so learning is very painful because it's always conflicting with what I believe and what I think I believe. For example I used to think that HIV AIDS was a cure for homosexuality. I no longer believe that simply because I was brought up being told that homosexuality was wrong. Now it's a choice or how they're born. It's not wrong in their eyes and I've come to learn and understand or understand before I learnt the difference between a choice and a way of life. (5:98)

Strategies

The most surprising result from this analysis was the level of dissonance that we noted between conceptions and strategies for learning. Over the three years of the study five students (1, 2, 6, 8, and 9) exhibited consistently dissonant conceptions and strategies. In earlier work (cf. Prosser & Trigwell, 1999) it was found that there was a close relationship between conceptions and strategies with quantitative conceptions usually associated with a surface approach and qualitative conceptions with a deep approach to learning. A surface approach entails the use of low level cognitive activities with the intention to "get the task out of the way with the minimum of trouble, while appearing to meet requirements" (Biggs, 1999, p. 14). On the other hand a deep approach is evidenced by strategies such as: reflecting on what is being learnt, relating ideas, seeking meaning and understanding, and questioning. Studies have shown that deeper and more meaningful study strategies are associated with better conceptual knowledge and an outcome of learning that evidences understanding (Marton & Säljö, 1997) while surface or rote strategies have been associated with poor performance on final examination questions

(Hegarty-Hazel & Prosser, 1991). Previously we reported the strategies these students used to learn during the first year of this research (Boulton-Lewis et al., 2000a, 2000b) and indicated that a variety of surface and deeper level strategies (Biggs, 1999) were being used. The analysis of strategies presented below advances this work by further analysing the strategies used by the students over three years according to the cognitive engagement required. We indicate this by organising the strategies according to whether the students used mainly lower level repetitive strategies to minimally active then to active strategies.

In this analysis it can be seen that all students in at least one year said they went '*over and over'* text in order to memorise or learn from it. The most characteristic feature of this strategy is the lack of variation within each reading (or writing) of a text, and between the subsequent readings (or writings) of the same text. Nothing is emphasized more than anything else, nothing is changed between each attempt. Everything is read (written) in the same way every time. At least this was the experience the students reported. This was the case even for students who expressed qualitative conceptions of learning (1, 2, 6, 8, 9, and in first year 13 and 22). Some examples of how they expressed this strategy are given below along with examples of other repetitive focusing and rehearsal strategies.

I: So what actually does study mean to you?

S: Probably just actually learning the material. Actually sitting there and for an exam … if I have to study for an exam I'll be copying out the sheet and rereading it over and over, you know, start doing that a week before the exam or something so I can t familiar on that.

I: So after you rewrite what you are actually studying, what's the process after that?

S: I find the easiest way for me to do it is probably writing it out again and reading it to myself and then reading it, reading it, reading it. (1:97)

I: Did you try and memorise them?

S: Yes. I wrote them over and over and over again on a piece of paper, the science word for it and the meaning for it. I used to write out a whole foolscap paper before I'd get it in my head. I used to try that method before as well, just getting there and saying the bold words and the definition and read it over, I used to do both, like read the other ones and the ones I don't get through I just write over and over until I get it. (2:97)

I: How do you actually memorise it?

S: Read it over and over, then I come back and then I cover it up and I see if I remember it then I'll have a look at it, if I'm right I'll keep going but if I'm not I'll read it again and again and again until I get it. (10:97)

In other cases the students reported doing more than simply reading (or writing) over and over again. They might for instance, become aware of variation in form and try to express the meaning of words, or they focus on key issues, words or concepts for instance, thereby perceiving variation between what is more important and what is less important. But there is no notion of transforming or reorganising the text, or questioning it or looking at it from another angle. We called such strategies "Minimal active strategies" in Table 1 below :

I: Well first of all like after reading it what's your process from there? Do you get it down on paper?

S: Usually I have major points that I have to look at like say we did in Psychology; we did different types of theorists and stuff so I put like each major one out of my lecture notes, that's each major theorist, right, and then what they did in my own words under each thing and then I've got that and then I know it. That's what I have to know when I get in there so. Then I can just study that I suppose. (1:97)

I: What do you actually do if you are given a chapter of a book to read and understand, well to learn, how would you go about it?

S: Well, I would read the chapter first. Then I would go through it again, highlight the relevant points that I think are important to the topic. I may write it down in like on blank piece of paper, summarise it in my own words of what the chapter is talking about. (7:97)

To an increasing extent students also reported on the use of more active strategies such as organisation of material, other ways of remembering, and elaboration. This meant that the text in question was not taken for granted: it could be expressed in other ways, structured differently; it could also be questioned. Furthermore, the students made their own distinctions between what was more central and what was less so, what kind of relations there were between different component parts, and the same text could be read several times, but differently. In some cases these were consistent with their conceptions and in others they were not. Examples of these strategies are provided below.

I: What about when you're trying to learn something, or study something, do you use techniques like visualisation or note form.

S: No, for me, whatever information is presented to me, I break it down to unsettle components and then I try and structure it to a sentence after that. I just write a sentence, go away, read that bit, write 5 or 6 sentences per point, per idea that the lecturer has brought up and that will be a better basis on which I build on. The way I build on that then is to grab a text book and read over an area that they've just spoken about and to see if that text book gives me any more information or reinforces what I have just heard from the lecturer. (5:97)

S: Getting it and reading about how that fits in with other things related to it. From listening to someone I will take notes. Sometimes I will take notes when I'm writing.

I: When you read it, how do you understand it?

S: Your mental picture in my head I suppose. Making a picture of what that process is and how that fits in. I'm just saying it. . . What place does this thing have in our society, or you know? Where do we find this, where you do find it, and the things around it? (13:97)

I: When you read stuff, how do you get the meaning out of it?

S: I don't know you usually try and - maybe if you read it and then try and argue it a bit.

I: How do you do that?

S: Like if you read it and you sort of put yourself like you don't - do you believe it or not and by doing that you sort of put it into more something that you know than you don't know. Do you know what I mean? (10:99)

Table 1. Conceptions and strategies by student each year of the study

Student	Conceptions			Strategies		
	Year			Year		
	1997	1998	1999	1997	1998	1999
1	B	D	E	_ *	_ +	_ *
2	D	D	E	_	_ *	_ *
4	B	B	B	_	_	_
5	D	F	F	_+	+	+
6	D	D	C	_	_	_
7	C	C	C	_*	*	*
8	D	D	D	_*	*	*

9	E	E	E	_	_	_
10	B	D	D	_*	_+	+
11	A	B	B	_	_	_*
13	D	D	D	_+	+	+
14	A	A	A	_	_	_
15	C	C	C	_*	*	*
16	C	C	C	_*	*	*
22	D	D	D	_+	+	+

Conceptions A to F are those described by Marton et al. (1993) with minor variations.
Strategies: '–' means use of `over and over' in interaction with text
* minimal active strategies
\+ means active strategies such as organisation and elaboration

Discussion

The most notable results can be summarized in the following points:

1 All of the students reported the use of the "over and over" strategy during the first year,

2 almost half of the students reported the use of this strategy even during the third year,

3 almost half of the students expressed qualitative conceptions of learning (D-F) during the first year and more than half of them during the second and the third years.

It was thus not the students' conceptions of learning that constrained their studying (which was our original expectation) but their ways of going about learning. In other words their conceptions were more advanced than the strategies they used. We therefore have to make sense of the comparatively more powerful conceptions of learning expressed and the comparatively less powerful strategies used.

We summarised these students' reasons for studying in previous papers (Boulton-Lewis et al., 2000a, 2000b). Some stated that *paying for studying* motivated their learning; others were studying so they could improve conditions for *Indigenous people*, whilst *personal development* was a motivation to study for others. However most of them were at university after a range of experiences in life and the workforce, knew why they had chosen their courses and why they wanted to succeed. The experience of learning at university for most of them was difficult, challenging and liberating. As we have described, clearly some of them had dissonant conceptions of learning and strategies and all of them exhibited some dissonance. Studies of dissonance have usually predicted such students will be at risk and others have shown that such students were seeking a deep approach but did not know how to achieve it. These students had conceptions that implied they should have been seeking a deep approach but some were using strategies that were not consistent with such learning. Nevertheless, despite the evident

dissonance, many of them have succeeded in their courses. Of particular note are students 1, 6, 8, 9 who have all graduated. These students were mentioned earlier as exhibiting consistently dissonant conceptions and strategies. Overall of 4 students in mainstream courses in one university 2 graduated, 1 moved to another course and will graduate soon, and only one withdrew. In the other university where students were enrolled in mainstream courses 4 of the 7 we initially interviewed have graduated or are still studying. Of the remaining 11 students who were studying in a specially designed problem based learning course 9 have graduated and 2 are still studying. Some students from this course have gone on to further graduate study and most are employed.

The question arises as to why the students in our sample succeeded so well despite their dissonant conceptions and strategies. It seems that the main reason is their strong motivation to obtain a qualification that would lead to a good job. Despite the odds they persisted with less than optimum approaches and mastered the necessary knowledge. Essentially their views of learning seemed to be conditioned by their strong motivation to learn something useful at university which would benefit their community and themselves. It is possible their experiences of living in different contexts made them well prepared to think of learning as resulting in new ways of seeing reality. All the students in this study volunteered to be interviewed which may also be an indication of their commitment to their courses. Also these students were usually the ones who made use of assistance provided by the support units in their universities or who were studying in a specially designed well resourced course.

The students were frequently oriented towards making sense of the phenomena dealt with in their studies and towards determining the reality of these phenomena. Such an orientation is a defining feature of what has been called the *deep approach* to studying (see Bowden & Marton, 1998). This is characterized by the learner seeing through the texts and focusing on "the real world". The students frequently tried to do so, but they often failed. Many times they did not manage to penetrate the texts they were reading. This is partly because most of them had a limited educational background in terms of academic language and knowledge and partly because they were dealing superficially with the texts; they read them again and again, they wrote down and read things over and over again often in the same way every time. Most of these students had not developed more powerful strategies (such as varying their acts of reading, consciously relating what they read to other things, reflecting on and playing around with the information, taking it apart and putting it together again in another way, "turning around" the object of learning and looking at it from different angles) before they entered university and many of them failed to do so by the time they finished their studies.

We believe that the students' problems with studying, in addition to sometimes adverse social and material conditions, had to do with the lack of prerequisites for university studies, such as necessary skills to learn. The strategy, which we keep referring to as "over and over again", reported by all the students in the first year, reflects the "taken-for-granted" nature of the experience of learning. The greatest change between the first and the second year interviews as Boulton-Lewis, Marton and Wilss (2001) reported for these students is the idea of alternative ways of studying. To be able to discern, talk about and deliberately change one's way of studying, one must have become aware of the fact that learning or studying is something that can be done in more than one way. You cannot possibly become aware of this without actually encountering variation in ways of learning and ways of studying through participating in conversations or reflecting on the topic. This probably was lacking in these students' lives prior to their enrolment in the studies focused on in this investigation. This is probably why the shift to awareness of alternative ways was found to be the most striking change between the first and second year interviews. The most striking developmental difference according to Table 1 above is the decreasing use of the strategy "over and over again". We interpret this as an sign of the students becoming better at learning. We believe they became better at learning due to their varied experiences of learning, both their own and others.

A recurring argument is that Aboriginal students have a special learning style (Hughes, 1987) and if university teachers could take that into consideration, perhaps difficulties in learning would diminish. However we have not identified any striking differences in the ways of going about learning between these students and other similar groups of students with comparative educational backgrounds when entering university. A majority of the students in our investigation emphasized the importance of visualization and practical modes of learning, but this is hardly unique (see for instance, Marton, 1974). Another thing is that academic studies require certain capabilities for developing practically useful knowledge in comparatively abstract forms. All the students in the group appeared to be aware of the demands and mostly they did all they could to meet them. Some more assistance in making up for missing pre-requisites for studies at university level in terms of knowledge and skills and with developing more powerful strategies in their studies would, no doubt, be beneficial. Given such support, students such as those participating in our study, with strong motivation and reality orientation, would in all likelihood be better prepared to cope with the challenges the courses offered for them.

We acknowledge that our sample was small and the findings therefore cannot be generalised, yet at the same time the results of our research have strong implications for the

teaching and learning of Indigenous students in the universities involved, and we would assert more widely. These students are usually granted special entry into university and they start with a disadvantage due to their limited prior knowledge and approaches to learning. They are there to achieve a goal. They need strong support, preferably related directly to the course in which they are studying. The success rate for students in our sample was greater for students in the special group than for those in mainstream courses. This may be due to the structure of the course undertaken by those in the special group. They received scaffolding and support and their study groups were small which facilitated closer interaction with the lecturers. The latter group could also access their support units but this is not as simple as being part of a collaborative small group working together in a specific program.

Despite their success, we believe that these students would have had a more enjoyable and successful university experience if they had been helped more to develop their strategies for learning. Such assistance might have been useful for them to alter their ways of studying so that they matched more closely to their conceptions and to those strategies required for effective formal learning at university. We do not believe that this should be done by means of general training of learning and thinking skills, but by thematizing the ways in which students learn and think about that which they are supposed to learn and think about in their own studies:

> Learning to think logically is not an instinct, it's something that has to be taught and something that you have to go through and experience to be able to learn. (2:98)

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[2] We acknowledge the support of the Swedish Council for Research in the Humanities and Social Sciences.
[3] The inclusive term Indigenous is used to denote both Aboriginal and Torres Strait Islander people.
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